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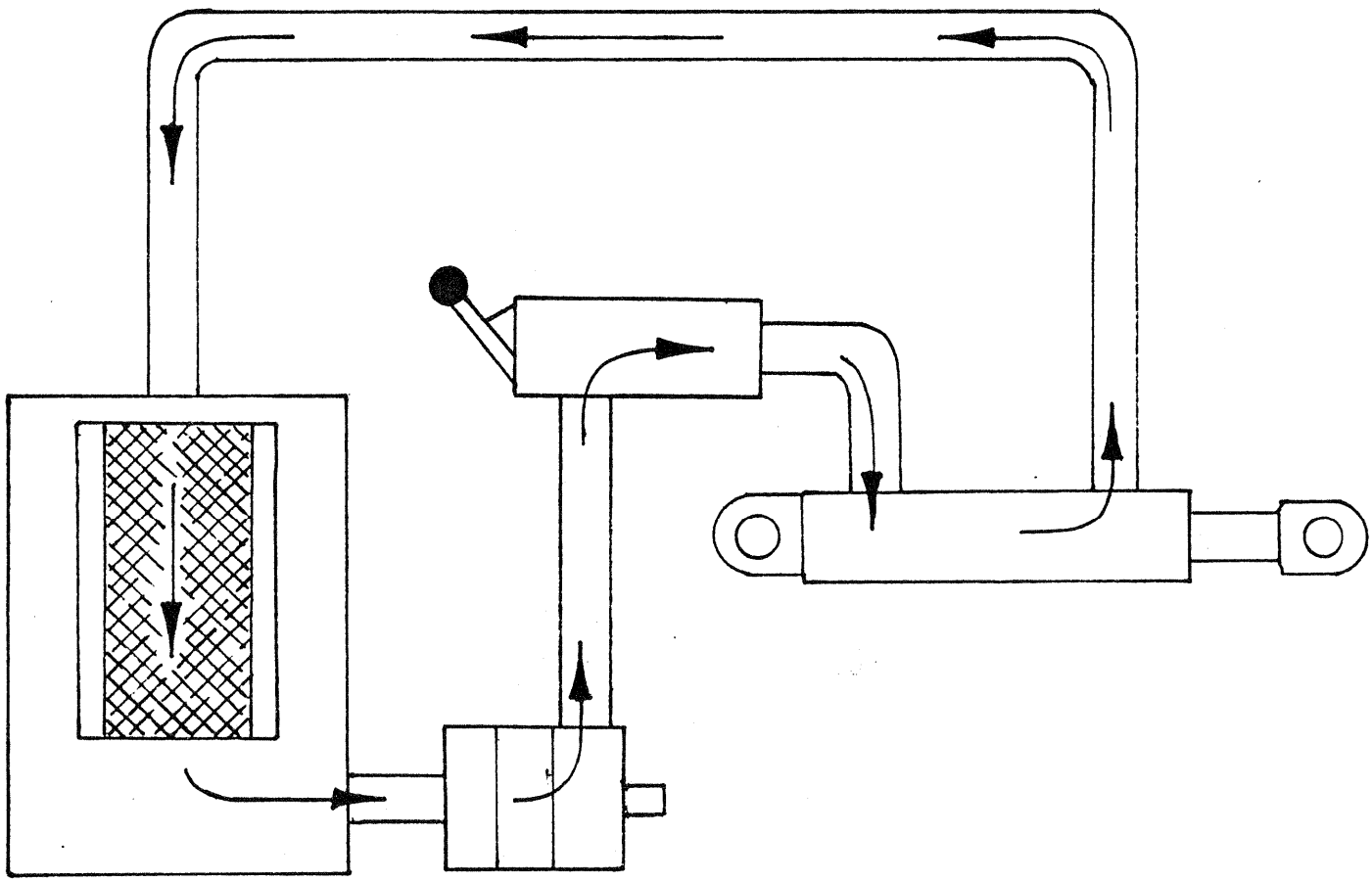
GLOSSARY OF HYDRAULIC TERMS



GLOSSARY OF HYDRAULIC TERMS

The definitions listed in this glossary are those which relate to products manufactured by WAGNER and are not intended to incompass the entire field of hydraulic terms.

ACCUMULATOR: A container in which fluid is stored under pressure as a source of fluid power.

ACTUATOR: A device for converting hydraulic energy into mechanical energy. A motor or cylinder.

AERATION: Air in the hydraulic fluid. Excessive aeration causes the fluid to appear milky and components to operate erratically because of the compressibility of the air trapped in the fluid.

ATMOSPHERE (ONE): A pressure measure equal to 14.7 psi.

ATMOSPHERIC PRESSURE: Pressure exerted by the atmosphere at any specific location. (Sea level pressure is approximately 14.7 pounds per square inch absolute.)

BACK PRESSURE: A pressure in series. Usually refers to pressure existing on the discharge side of a load. It adds to the pressure required to move the load.

BAFFLE: A device, usually a plate, installed in a reservoir to separate the pump inlet from return lines.

BLEED-OFF: To divert a specific controllable portion of pump delivery directly to reservoir.

BREATHER: A device which permits air to move in and out of a container or component to maintain atmospheric pressure.

BY-PASS: A secondary passage for fluid flow.

CARTRIDGE:
1. The replaceable element of a fluid filter.
2. The pumping unit from a vane pump, composed of the rotor, ring, vanes and one or both side plates.

CAVITATION: A localized gaseous condition within a liquid stream which occurs where the pressure is reduced to the vapor pressure.

CHAMBER: A compartment within a hydraulic unit. May contain elements to aid in operation or control of a unit. Examples: spring chamber, drain chamber, etc.

CHECK VALVE: A valve which permits flow of fluid in one direction only.

CIRCUIT: An arrangement of components interconnected to perform a specific function within a system.

COMMAND SIGNAL (or input signal): An external signal to which the servo must respond. (See SERVO VALVE).

COMPENSATOR CONTROL: A displacement control for variable pumps and motors which alters displacement in response to pressure changes in the system as related to its adjusted pressure setting.

COMPONENT: A single hydraulic unit.

COMPRESSIBILITY: The change in volume of a unit volume of a fluid when it is subjected to a unit change in pressure.

CONTROL: A device used to regulate the function of a unit.

COOLER: A heat exchanger used to remove heat from the hydraulic fluid.

COUNTERBALANCE VALVE: A pressure control valve which maintains back pressure to prevent a load from falling.

CRACKING PRESSURE: The pressure at which a pressure actuated valve begins to pass fluid.

CUSHION: A device sometimes built into the ends of a hydraulic cylinder which restricts the flow of fluid at the outlet port, thereby arresting the motion of the piston rod.

CYLINDER: A device which converts fluid power into linear mechanical force and motion. It usually consists of a movable element such as a piston and piston rod, plunger rod, plunger or ram, operating within a cylindrical bore.

DECOMPRESSION: The slow release of confined fluid to gradually reduce pressure on the fluid.

DELIVERY: The volume of fluid discharged by a pump in a given time, usually expressed in gallons per minute (gpm).

DIRECTIONAL VALVE: A valve which selectively directs or prevents fluid flow to desired channels.

DISPLACEMENT: The quantity of fluid which can pass through a pump, motor or cylinder in a single revolution or stroke.

DOUBLE ACTING CYLINDER: A cylinder in which fluid force can be applied to the movable element in either direction.

DRAIN: A passage in, or a line from, a hydraulic component which returns leakage fluid independently to reservoir or to a vented manifold.

ENCLOSURE: A rectangle drawn around a graphical component or components to indicate the limits of an assembly.

FILTER: A device whose primary function is the retention by a porous media of insoluble contaminants from a fluid.

FLOW CONTROL VALVE: A valve which controls the rate of oil flow.

FLOW RATE: The volume, mass, or weight of a fluid passing through any conductor per unit of time.

FLUID:
1. A liquid or gas.
2. A liquid that is specially compounded for use as a power-transmitting medium in a hydraulic system.

FOUR-WAY VALVE: A directional valve having four flow paths.

FULL FLOW: In a filter, the condition where all the fluid must pass through the filter element or medium.

HEAD: The height of a column or body of fluid above a given point expressed in linear units. Head is often used to indicate gauge pressure. Pressure is equal to the height times the density of the fluid.

HEAT: The form of energy that has the capacity to create warmth or to increase the temperature of a substance. Any energy that is wasted or used to overcome friction is converted to heat.

HORSEPOWER - (HP): The power required to lift 550 pounds one foot in one second or 33,000 pounds on foot in one minute.

HYDRAULIC BALANCE: A condition of equal opposed hydraulic forces acting on a part in a hydraulic component.

HYDRAULIC CONTROL: A control which is actuated by hydraulically induced forces.

HYDRAULICS: Engineering science pertaining to liquid pressure and flow.

HYDRODYNAMICS: Engineering science pertaining to the energy of liquid flow and pressure.

HYDROSTATICS: Engineering science pertaining to the energy of liquids at rest.

KINETIC ENERGY: Energy that a substance of body has by virtue of its mass (weight) and velocity.

LAMINAR (FLOW): A condition where the fluid particles move in continuous parallel paths. Streamline flow.

LINE: A tube, pipe or hose which acts as a conductor of hydraulic fluid.

LINEAR ACTUATOR: A device for converting hydraulic energy into linear motion - a cylinder or ram.

MANIFOLD: A fluid conductor which provides multiple connection ports.

MANUAL CONTROL: A control actuated by the operator, regardless of the means of actuation. Example: Lever or foot pedal control for directional valves.

MANUAL OVERRIDE: A means of manually actuating an automatically-controlled device.

MECHANICAL CONTROL: Any control actuated by linkages, gears, screws, cams or other mechanical elements.

METER: To regulate the amount or rate of fluid flow.

METER-IN: To regulate the amount of fluid flow into an actuator or system.

METER-OUT: To regulate the flow of the discharge fluid from an actuator or system.

MICRON: One-millionth of a meter or about .00004 inch.

MICRON RATING: The size of the particles a filter will remove.

MOTOR: A device which converts hydraulic fluid power into mechanical force and motion. It usually provides rotary mechanical motion.

OPEN CENTER CIRCUIT: One in which pump delivery flows freely through the system and back to the reservoir in neutral.

OPEN CENTER VALVE: One in which all ports are interconnected and open to each other in the center or neutral position.

ORIFICE: A restriction, the length of which is small in respect to its cross-sectional dimensions.

PASSAGE: A machined or cored fluid conducting path which lies within or passes through a component.

PILOT PRESSURE: Auxiliary pressure used to actuate or control hydraulic components.

PILOT VALVE: An auxiliary valve used to control the operation of another valve. The controlling stage of a 2-stage valve.

PISTON: A cylindrically shaped part which fits within a cylinder and transmits or receives motion by means of a connecting rod.

PLUNGER: A cylindrically shaped part which has only one diameter and is used to transmit thrust. A ram.

POPPET: That part of certain valves which prevents flow when it closes against a seat.

PORT: An internal or external terminus of a passage in a component.

POSITIVE DISPLACEMENT: A characteristic of a pump or motor which has the inlet positively sealed from the outlet so that fluid cannot recirculate in the component.

POWER: Work per unit of time. Measured in horsepower (hp) or watts.

PRESSURE: Force per unit area; usually expressed in pounds per square inch (psi).

PRESSURE DROP: The difference in pressure between any two points of a system or a component.

PRESSURE LINE: The line carrying the fluid from the pump outlet to the pressurized port of the actuator.

PRESSURE OVERRIDE: The difference between the cracking pressure of a valve and the pressure reached when the valve is passing full flow.

PRESSURE REDUCING VALVE: A valve which limits the maximum pressure at its outlet regardless of the inlet pressure.

PRESSURE SWITCH: An electric switch operated by fluid pressure.

PROPORTIONAL FLOW: In a filter, the condition where part of the flow passes through the filter element in proportion to pressure drop.

PUMP: A device which converts mechanical force and motion into hydraulic fluid power.

RAM: A single-acting cylinder with a single diameter plunger rather than a piston and rod. The plunger in a ram-type cylinder.

RECIPROCATION: Back-and-forth straight line motion or oscillation.

RELIEF VALVE: A pressure operated valve which by-passes pump delivery to the reservoir, limiting system pressure to a predetermined maximum value.

RESERVOIR: A container for storage of liquid in a fluid power system.

RESTRICTION: A reduced cross-sectional area in a line or passage which produces a pressure drop.

RETURN LINE: A line used to carry exhaust fluid from the actuator back to sump.

SEQUENCE:
1. The order of a series of operations or movements.
2. To divert flow to accomplish a subsequent operation or movement.

SEQUENCE VALVE: A pressure operated valve which, at its setting, diverts flow to a secondary line while holding a predetermined minimum pressure in the primary line.

SERVO VALVE:
1. A valve which modulates output as a function of an input command.
2. A follow valve.

SIGNAL: A command or indication of a desired position or velocity.

SINGLE ACTING CYLINDER: A cylinder in which hydraulic energy can produce thrust or motion in only one direction.

SPOOL: A term loosely applied to almost any moving cylindrically shaped part of a hydraulic component which moves to direct flow through the component.

STRAINER: A coarse filter.

STROKE:
1. The length of travel of a piston or plunger.
2. To change the displacement of a variable displacement pump or motor.

SUCTION LINE: The hydraulic line connecting the pump inlet port to the reservoir or sump.

SUMP: A reservoir.

SURGE: A transient rise of pressure or flow.

TANK: The reservoir or sump.

TURBULENT FLOW (Turbulence): A condition where the fluid particles move in random paths rather than in continuous parallel paths.

TWO-WAY VALVE: A directional control valve with two flow paths.

UNLOAD: To release flow (usually directly to the reservoir), to prevent pressure being imposed on the system or portion of the system.

UNLOADING VALVE: A valve which by-passes flow to tank when a set pressure is maintained on its pilot port.

VACUUM: Pressure less than atmospheric pressure. It is usually expressed in inches of mercury (in.Hg) as referred to the existing atmospheric pressure.

VALVE: A device which controls fluid flow direction, pressure, or flow rate.

VELOCITY:
1. The speed of flow through a hydraulic line. Expressed in feet per second (fps) or inches per second (ips).
2. The speed of a rotating component measured in revolutions per minute (rpm).

VENT:
1. To permit opening of a pressure control valve by opening its pilot port (vent connection) to atmospheric pressure.
2. An air breathing device on a fluid reservoir.

VISCOSITY: A measure of the internal friction or the resistance of a fluid to flow.

VOLUME:
1. The size of a space or chamber in cubic units.
2. Loosely applied to the output of a pump in gallons per minute (gpm).

WORK: Exerting a force through a definite distance. Work is measured in units of force multiplied by distance; for example, pound-foot.